

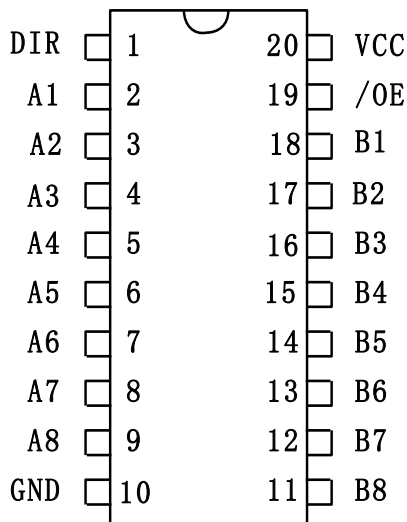


74HC245(文件编号: S&CIC0524)

OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

- High-current 3-stage outputs drive bus lines directly or up to 15 LSTTL loads
- Package options include plastic small-outline (DW), shrink small-outline (DB), thin shrink small-outline (PW), and ceramic flat (W) packages, ceramic chip carriers (FK), and standard plastic (N) and ceramic (J) 300-mil DIPs

74HC245... D, DB, N, OR PW PACKAGI
(TOP VIEW)



DESCRIPTION

These octal bus transceivers are designed for asynchronous two-way communication between data buses. The control-function implementation minimizes external timing requirements.

The devices allow data transmission from the A bus to the B bus or from the B bus to the A bus, depending on the logic level at the direction-control (DIR) input. The output-enable (/OE) input can be used to disable the device so that the buses are effectively isolated.

The 74HC245 is characterized for operation from -40°C to 85°C .

FUNCTION TABLE
(each gate)

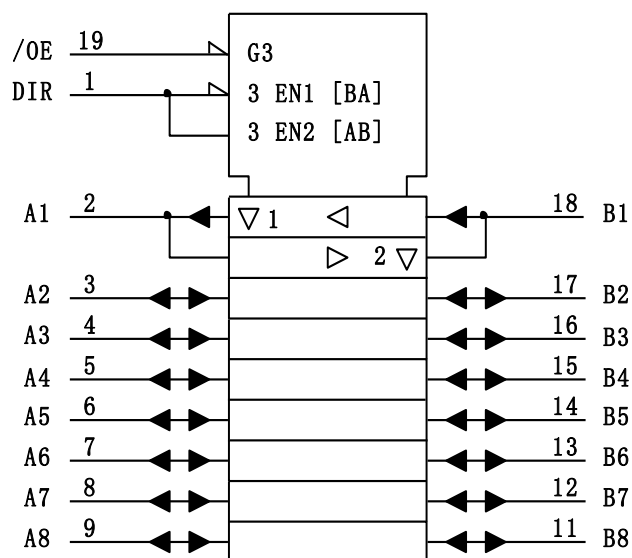
INPUTS		OUTPUT
/OE	DIR	Y
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation



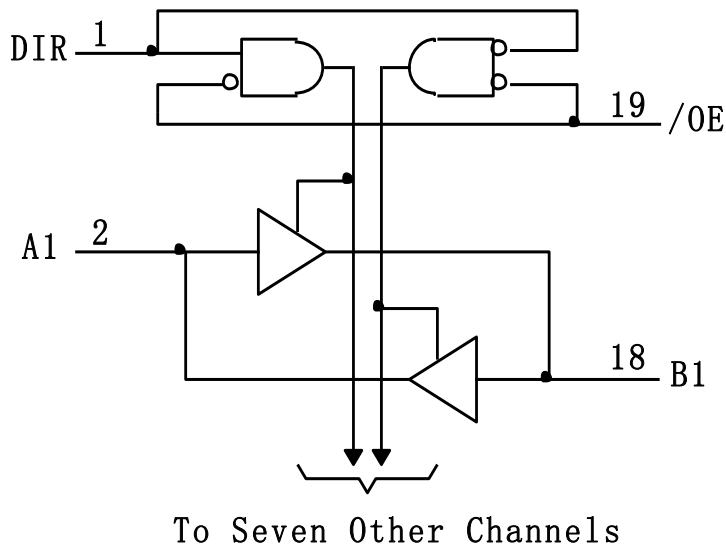
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LOGIC SYMBOL



LOGIC DIAGRAM (positive logic)





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absolute maximum ratings over operating free-air temperature range

Supply voltage range, V_{CC}	-0.5V to 7V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$) (see Note 1)	$\pm 20\text{mA}$
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$) (see Note 1)	$\pm 20\text{mA}$
Continuous output current, I_O ($V_O = 0$ to V_{CC}).....	$\pm 35\text{mA}$
Continuous current through V_{CC} to GND.....	$\pm 70\text{mA}$
Package thermal impedance, θ_{JA} (see Note 2): DB package.....	115°C/W
DW package.....	97°C/W
N package.....	67°C/W
PW package.....	128°C/W
Storage thermal impedance, T_{stg}	-65°C to 150°C

Notes: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. The package thermal impedance is calculated in accordance with JESD 51, except for through-hole packages, which use a trace length of zero.

RECOMMENDED OPERATING CONDITIONS

		74HC245			UNIT
		MIN	NOM	MAX	
V_{CC}	Supply voltage	2	5	6	V
V_{IH}	High-level input voltage	$V_{CC} = 2\text{V}$	1.5	-	V
		$V_{CC} = 4.5\text{V}$	3.15	-	
		$V_{CC} = 6\text{V}$	4.2	-	
V_{IL}	Low-level input voltage	$V_{CC} = 2\text{V}$	0	-	V
		$V_{CC} = 4.5\text{V}$	0	-	
		$V_{CC} = 6\text{V}$	0	-	
V_I	Input voltage	0	-	V_{CC}	V
V_O	Output voltage	0	-	V_{CC}	V
t_i	Input transition (rise and fall) time	$V_{CC} = 2\text{V}$	0	-	ns
		$V_{CC} = 4.5\text{V}$	0	-	
		$V_{CC} = 6\text{V}$	0	-	
T_A	Operating free-air temperature	-40	-	85	°C



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Electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS	V _{cc}	T _A = 25°C			74HC245		UNIT
				MIN	TYP	MAX	MIN	MAX	
V _{OH}	V _I = V _{IH} or V _{IL}	I _{OH} = -20uA	2V	1.9	1.998	-	1.9	-	V
			4.5V	4.4	4.499	-	4.4	-	
			6V	5.9	5.999	-	5.9	-	
		I _{OH} = -6mA	4.5V	3.98	4.3	-	3.84	-	
		I _{OH} = -7.8mA	6V	5.48	5.8	-	5.34	-	
V _{OL}	V _I = V _{IH} or V _{IL}	I _{OH} = 20uA	2V	-	0.002	0.1	-	0.1	V
			4.5V	-	0.001	0.1	-	0.1	
			6V	-	0.001	0.1	-	0.1	
		I _{OH} = 6mA	4.5V	-	0.17	0.26	-	0.33	
		I _{OH} = 7.8mA	6V	-	0.15	0.26	-	0.33	
I _I	DIR or /OE	V _I = V _{cc} or 0	6V	-	±0.1	±100	-	±1000	nA
I _{OZ}	A or B	V _O = V _{cc} or 0	6V		±0.01	±0.5		±5	uA
I _{cc}		V _I = V _{cc} or 0, I _O = 0	6V	-	-	8	-	80	uA
Ci	DIR or /OE		2V to 6V	-	3	10	-	10	pF

Switching characteristics over recommended operating free-air temperature range, C_L = 50pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	VCC	T _A = 25°C			74HC245		UNIT
				MIN	TYP	MAX	MIN	MAX	
tpd	A or B	B or A	2V	-	40	105	-	130	ns
			4.5V	-	15	21	-	26	
			6V	-	12	18	-	22	
t _{en}	/OE	A or B	2V	-	125	230	-	290	ns
			4.5V	-	23	46	-	58	
			6V	-	20	39	-	49	
t _{dis}	/OE	A or B	2V	-	74	200	-	250	ns
			4.5V	-	25	40	-	50	
			6V	-	21	34	-	43	
t _t		A or B	2V	-	20	60	-	75	ns
			4.5V	-	8	12	-	15	
			6V	-	6	10	-	13	



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OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

Switching characteristics over recommended operating free-air temperature range, $C_L = 150\text{pF}$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	VCC	$T_A = 25^\circ\text{C}$			74HC245		UNIT
				MIN	TYP	MAX	MIN	MAX	
tpd	A or B	B or A	2V	-	54	135	-	170	ns
			4.5V	-	18	27	-	34	
			6V	-	15	23	-	29	
t_{en}	/OE	A or B	2V	-	150	270	-	335	ns
			4.5V	-	31	54	-	37	
			6V	-	25	46	-	56	
t_t		A or B	2V	-	45	210	-	265	ns
			4.5V	-	17	42	-	53	
			6V	-	13	36	-	45	

Operating characteristics, $T_A = 25^\circ\text{C}$

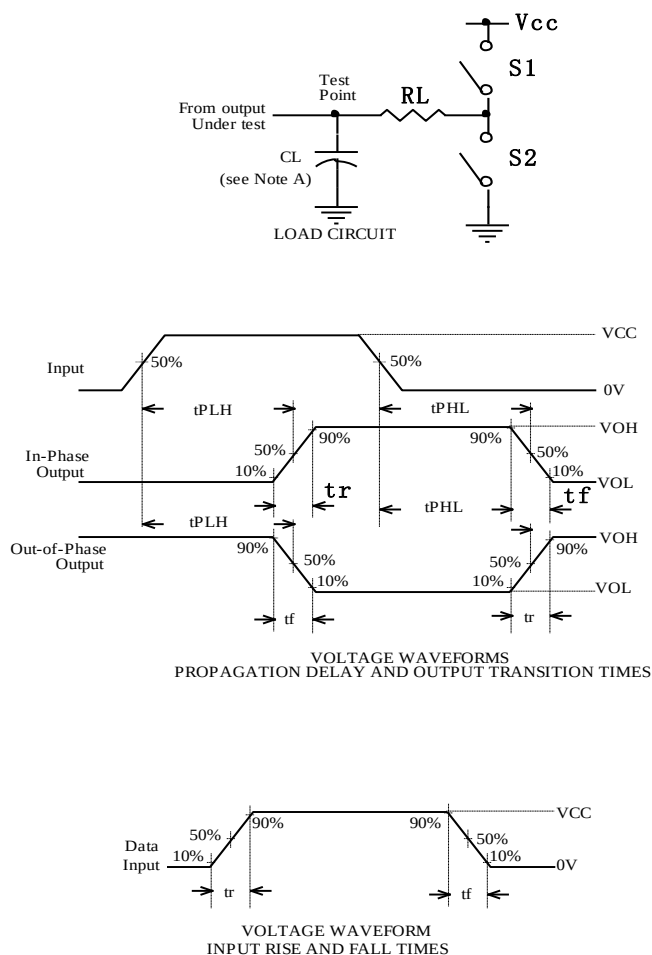
PARAMETER		TEST CONDITIONS	TYP	UNIT
Cpd	power dissipation capacitance per gate	No load	40	pF



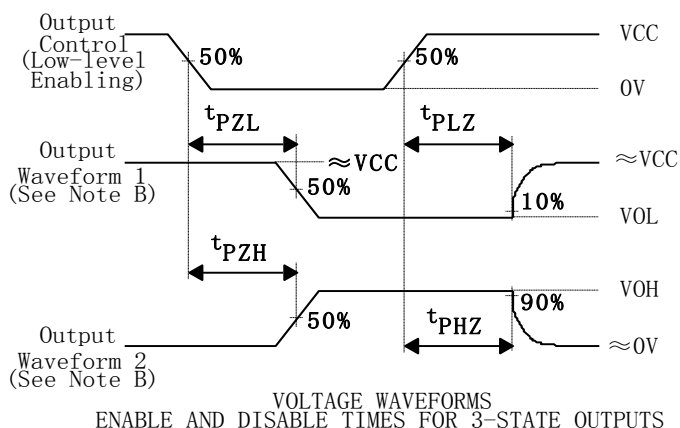
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PARAMETER MEASUREMENT INFORMATION



PARAMETER	RL	CL	S1	S2
t_{en}	1K Ω	50pF or 150pF	Open	Closed
			Closed	Open
t_{dis}	1K Ω	50pF	Open	Closed
			Closed	Open
t_{pd} or t_t	—	50pF or 150pF	Open	Open



NOTES: A. C_L includes probe and test-fixture capacitance.

B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.

Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.

C. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1$ MHz, $Z_O = 50 \Omega$, $t_r = 6$ ns, $t_f = 6$ ns.

D. The outputs are measured one at a time with one input transition per measurement.

E. t_{PLZ} and t_{PHZ} are the same as t_{dis} .

F. t_{PZL} and t_{PZH} are the same as t_{en} .

G. t_{PLH} and t_{PHL} are the same as t_{pd} .

Figure 1. Load circuit and voltage waveforms